MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
CONCRETE JOINT REPAIR, CASE A, USING LATEX MODIFIED CONCRETE (7 SACK)

a. Description. This work consists of repairing concrete joints by partial depth milling and hand chipping to remove deteriorated and delaminated concrete; preparation, placement, finishing and curing of the latex modified concrete material; and sealing cracks and joints. Complete all joint repair work according to the Standard Specifications for Construction, except as modified by this special provision.

Repair locations will be as directed by the Engineer.

b. Materials. Use a bonding grout consisting of equal weights of Portland cement and number 2NS sand, mixed mechanically with sufficient amount of a 50-50 mixture of latex and water to form a slurry with the consistency of thick cream.

Use a concrete mixture containing the following materials per cubic yard.

Portland Cement, Type	658 lb
Mix Water, Net	168 lb
Latex Admixture	140 lb
2NS Fine Aggregate, Dry	1348 lb
26A Coarse Aggregate, Dry	1458 lb

Concrete air-entrainment and slump must be as follows:

Entrained Air	4.5 +/- 1.5 percent
Slump	1 - 6 inches

In addition to the requirements of Section 902 of the standard specifications, the 26A coarse aggregate must have a maximum absorption (24-hour soak method) of 2.50 percent according to ASTM C 127.

Hot-poured joint sealant must meet subsection 914.04.A. Backer rod for use with hot-poured joint sealant must meet subsection 914.04.B.

c. Equipment. Use a planing or milling machine equipped with a cutting drum designed for grinding concrete to close tolerances. The milling drum must be able to cut continuously, parallel to the joint and be adjustable to depths of 6 inches. The milling drum must be equipped with side cutters which cut a vertical edge for repair depths greater than 2 inches. The manufacturer of the milling drum must provide documentation form at least two sources that demonstrates compliance with the stated specifications.

d. Construction.

Temperature Limitations. Do not place concrete repairs at air temperatures below 50°F, nor above 90°F. Insulate repairs when air temperature is below 60°F or when the pavement concrete temperature is below 50°F.

Surface Preparation. Remove deteriorated concrete and patching material by milling within the limits shown in the detail for Concrete Joint Repair, Case A, including deteriorated concrete a minimum of 2 inches to a maximum of half the pavement depth, or to the top of the tie bars. Remove any mesh reinforcement within the repair areas. Use light-weight chipping hammer (15 lb) to remove all slivers of concrete less than 1 inch wide remaining along the repair area after milling. After milling and chipping, sound all exposed surfaces with a steel bar to detect delaminations. If delaminations are detected, remove the effected concrete and resound the areas. Clean exposed surfaces using high pressure water cleaning, with a minimum pressure of 3000 psi with a 15 degree tip. Re-establish transverse joints in the same configuration as the existing pavement.

Bonding Grout. The surface of the concrete must be damp, without excess water, at the time bonding grout is applied. Apply bonding grout immediately prior to concrete placement. Apply grout either by brushing or scrubbing (with a stiff bristle broom) onto the prepared concrete surface. If the grout whitens before concrete placement, it must be removed by sand blasting and the area re-grouted. Do not re-temper the grout.

Concrete Placement and Finishing. After the concrete is placed and screeded to the elevation of the surrounding pavement surface, seal all edges with mortar by working concrete outward toward existing hardened pavement concrete. Broom-finish the surface.

Joints and Crack Relief. Re-establish longitudinal and transverse joints, associated with existing pavement, through repairs. Provide crack relief at all locations where the repair is intersected by a full-depth pavement crack. Establish joints and crack relief cuts through the full depth of the repair by either sawing a minimum 1/4 inch wide cut as soon as possible after initial set without excessive raveling and before any cracking occurs, or by installing a 1/4 inch wide compressible isolation joint material into the crack prior to concrete placement. If sawing is used to isolate joints and cracks, remove the wet cure only long enough to saw and flush the joints and cracks before reestablishing the wet cure. If isolation joint material is used, it must be maintained vertical throughout the entire thickness of the repair. Thoroughly clean all joints and crack relief cuts by water flushing immediately after sawing.

Wet Cure. Cover the repair with wet burlap immediately after finishing. Use only burlap that has been soaked in water for a minimum of 12 hours prior to application. Cover and fully secure the burlap with polyethylene sheeting. The burlap and polyethylene sheeting must extend beyond the perimeter of the repair area a minimum of 6 inches. Keep the burlap fully saturated and protected with the polyethylene sheeting for a minimum 24 hours after concrete finishing.

Sealing Joints and Crack Relief. Remove isolation joint material to a depth of 2 inch below the pavement surface. Immediately prior to sealing, the joints and crack relief cuts must be clean, dry, and free of all incompressible material. Seal the joints and crack relief cuts with hot-poured sealant as specified in subsection 602.03.S of the standard specifications. The top of the sealant (after cooling) must be flush to 1/8 inch below the surface of the pavement.

Opening to Traffic. Wet cure the concrete for 24 hours and do not open to traffic until a compressive strength of 2500 psi is achieved.

e. Delayed Acceptance. Prior to final acceptance, repair all damage to any in-place pavement, roadway structure, or appurtenance resulting from the preparation, repair, or curing operation, as directed by the Engineer. All costs associated with this repair will be borne by the Contractor.

The Department will inspect all repairs for failures one month after the repairs are open to traffic. Evidence of bond loss, delamination, or spalling will be considered failure of a repair. Delaminations will be detected by sounding with a steel bar. All failed repairs must be removed and replaced, or otherwise correct to the satisfaction of the Engineer.

Submit a plan to the Engineer for the completion of this work including an acceptable completion time. All costs associated with restoring failed repairs will be borne by the Contractor.

f. Measurement and Payment. The completed work as described will be paid for at the contract unit price for the following contract item (pay item):

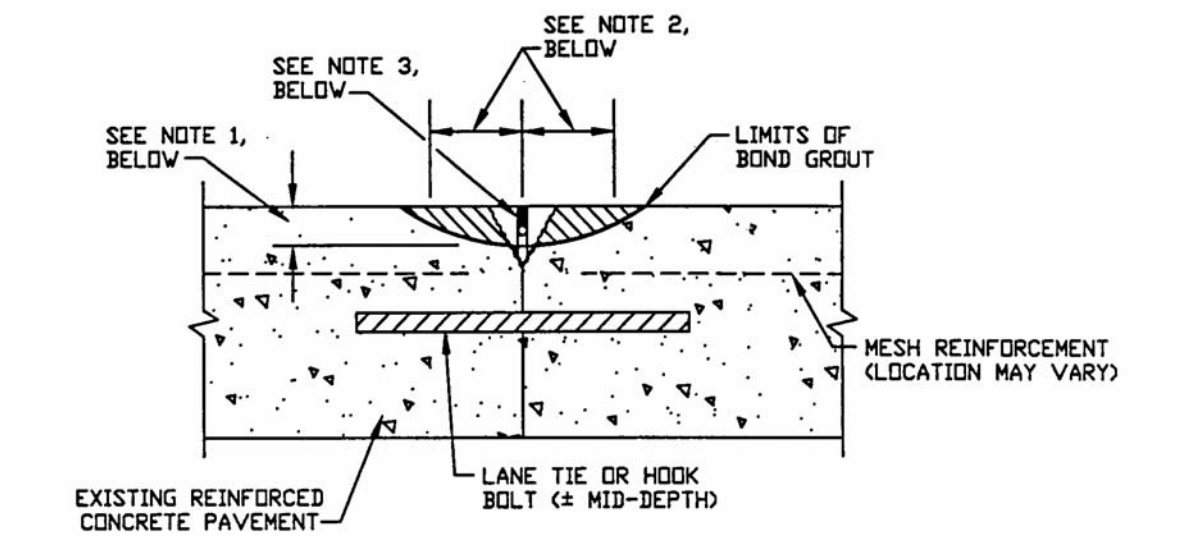
Contract Item (Pay Item)	**Pay Unit**
Conc Joint Repair, Case A, (LMC), Special	Foot
Latex Modified Conc	Cubic Yard

Payment for **Conc Joint Repair, Case A, (LMC), Special** includes all work required to prepare the area to be repaired; to consolidate, finish, and cure the repair mixture material; and to provide crack relief and seal cracks and joints, according to this special provision. This item will be measured along the repaired joint.

Latex Modified Conc includes all work required to furnish and place the latex modified concrete. **Latex Modified Conc** will be measured and paid for by the theoretical yield of the mix design and documented by the ticket printout. Deductions will be made for material wasted or rejected.

All costs associated with providing traffic control required to restore failed repairs, as described in section (e) of this special provision, will be included in the item **Conc Joint Repair, Case A, (LMC), Special**. Traffic control to perform the delayed acceptance inspection will be provided by the Department.

CONC JOINT REPAIR, CASE A



AREA TO BE REMOVED

NOTES:

1. 2 inches MIN. REMOVAL TO A MAX. OF 1/2 THE PAVEMENT DEPTH OR TO THE TOP OF THE TIE BAR, WHICHEVER IS LESS.

2. 5 inches MIN. WIDTH, MAX. TO MATCH THE WIDTH OF THE SPALL.

3. 1/4 inch SAWCUT TO EXTEND THROUGH THE DEPTH OF THE REPAIR. TOP OF 3/8 inch BACKER ROD TO BE LOCATED 1 inch BELOW PAVEMENT SURFACE.